radiator into the engine compartment, and a second air path for leading air that has passed through said radiator out of the engine compartment.

7. (AMENDED) A front end structure according to Claim 1, wherein the duct structure of the front end panel includes a shroud for closing a gap between the fan unit and the heat exchanger to prevent air blown by the fan unit from bypassing the heat exchanger.

REMARKS

Claims 1-7 remain pending in the present application. Claims 1-7 have been amended. Basis for the amendments and new claims can be found throughout the specification, claims and drawings as originally filed.

PRIORITY

Applicant has corrected the reference to the priority application appearing under the Cross-Reference to Related Applications section of the specification.

DRAWINGS

The drawings are objected to under 37 CFR 1.83 (a). Applicant believes Figure 5 illustrates the two air paths. On page 10, beginning on line 4, the specification describes Figure 5 as having a first air path 461 for leading the air into the engine compartment and a second air path 462 for leading air out of the engine compartment. Withdrawal of the objection is respectfully requested.

SPECIFICATION

The amended abstract of the disclosure is objected to because of various informalities. The Abstract has been amended to overcome the objection. Withdrawal of the objection is respectfully requested.

CLAIM OBJECTIONS

Claims 1 through 7 are objected to because of various informalities. The claims have been amended to overcome the objections. Withdrawal of the objection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 112

Claims 1 through 7 are rejected under 35 U.S.C 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims have been amended to overcome the objections. Reconsideration of the rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 102

Alternately for Claims 1 through 6, and as best can be understood in view of the indefiniteness of claims, Claims 1 through 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Tepas et al. Alternately, and as best can be understood in view of the indefiniteness of the claims, Claims 1 through 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Bolton et al. Applicant respectfully traverses the rejection. Both Tepas et al. and Bolton et al. disclose a front end structure where the

fan assembly is located downstream with respect to the air flow direction (behind) and not upstream with respect to the air flow direction (in front of). Tepas et al. states in column 2, lines 51-53 that the walls of the fan shroud assure that air passing through the grill opening and the condenser is forced through the radiator. Figure 1 illustrates grill opening 12, condenser 40 and radiator 22 with fan shroud 38 being located behind these components. Figure 1 of Bolton et al. clearly illustrates the fan 22 being located behind or downstream of the radiator 24, the condenser 26 and the front end 18 of the vehicle.

Thus, Applicant believes Claim 1, patentably distinguishes over the art of record. Likewise, Claims 2-7 which ultimately depend from Claim 1 are also believed to patentably distinguish over the art of record. Reconsideration of the rejection is respectfully requested.

See the discussion below regarding the application of these two references under 35 U.S.C § 103.

REJECTION UNDER 35 U.S.C. § 103

As best can be understood in view of the indefiniteness of the claims, claims 1 through 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holka. It is the Examiners position that Holka discloses the fan units 34 or 44 as being downstream of the heat exchanger 14 but absent the establishment of unexpected results, there is no invention in shifting the location of the fan units. Applicant respectfully traverses this opinion of the Examiner with respect to Holka as well as with respect to Tepas et al. and Bolton et al. which also have the fan located downstream.

In Holka, fan units 34, 44 are arranged downstream of a radiator 14 (heat exchanger assembly) as in the inventions of Tepas et al. and Bolton et al. On the other hand, in the present invention, a fan unit is arranged upstream of a radiator and a condenser (heat exchanger assemblies).

If the fan unit is arranged downstream of the heat exchanger, the fan unit sucks air through the heat exchanger. The temperature of air around the fan which is located in the engine compartment is high and the density of this air is low.

In general, the quantity of air flow in the fan unit is proportional to a lift *L* of a blade of the fan unit, and the relation between the lift *L* and the density *p* of air is indicated by the following formula.

$$L = C_L \cdot S \cdot p \cdot V^2 / 2$$

Here is C_L: lie coefficient , S: area of a blade, and V: air flow speed.

Accordingly, the quantity of air flow in the fan unit is proportional to the density of air. Thus, if the fan unit is arranged downstream of the heat exchanger as shown in the above three references, the fan unit sucks the air, the density of which is low, and thus the quantity of air flow is reduced.

On the other hand, in the present invention, the fan unit is arranged upstream of the heat exchanger in the area outside of the engine compartment. The fan unit blows air, the temperature of which is low and the density of which is high, and thus the quantity of air flow can be increased to increase the efficiency of the heat exchangers.

This feature is discussed on page 7, lines 13-26 of the present specification. Another feature of this location of the fan is that the fan will operate in a

cooler environment. This is discussed on page 8, lines 14-26 of the present specification.

Thus, Applicant believes Claim 1, patentably distinguishes over the art of record. Likewise, Claims 2-6 which ultimately depend from Claim 1 are also believed to patentably distinguish over the art of record. Reconsideration of the rejection is respectfully requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: Nov 18, 2002

By: _____
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ATTACHMENT FOR SPECIFICATION AMENDMENTS

The following is a marked up version of each replacement paragraph and/or section of the specification in which underlines indicates insertions and brackets indicate deletions.

Please replace the paragraph beginning on Page 1, line 5 with the following new paragraph:

This application is based upon and claims priority from Japanese Patent Application No. 2000-027271, filed January 31, 2000, No. 2000-303584, filed October 3, 2000 and No. 2000-365237, filed November 30, 2000, [the contents being incorporated herein by reference,] and is a continuation of PCT/JP01/00681, filed January 31, 2001.

ATTACHMENT FOR CLAIM AMENDMENTS

The following is a marked up version of each amended claim in which underlines indicates insertions and brackets indicate deletions.

1. (AMENDED) A front end structure of an automotive vehicle comprising a front end panel and vehicle front end parts including at least a radiator for cooling engine cooling water and a heat exchanger for cooling refrigerant,

wherein the radiator and the heat exchanger are arranged in series with respect to an air flow direction defined by air [flow] flowing through the radiator and the heat exchanger, the radiator and the heat exchanger being fixed to the front end panel, and

wherein said front end panel includes an inlet opening for introducing air into an engine compartment of the automotive vehicle and a duct structure for preventing [the] air introduced from the inlet opening from bypassing the radiator and the heat exchanger, the front end panel being formed to enclose a circumference of the radiator and the heat exchanger, and

the front end structure further comprising a fan unit arranged upstream of the radiator and the heat exchanger with respect to the air flow direction for blowing the air toward the radiator and the heat exchanger.

2. (AMENDED) A front end structure according to Claim 1, wherein said front end panel is integrally formed [by]from a resin [and fixed to a vehicle body at the vehicle front end portion thereby to constitute a vehicle structural member].

3. (AMENDED) A front end structure according to Claim 1, wherein said front end panel [is integrally formed with]defines a first air path for leading [the] air that has passed through said radiator into the engine compartment, and a second air path for leading [the] air that has passed through said radiator out of the engine compartment.

4. (AMENDED) A front end structure of an automotive vehicle comprising a front end panel and vehicle front end parts including at least a radiator for cooling engine cooling water and a heat exchanger for cooling refrigerant,

wherein the radiator and the heat exchanger are arranged in series with respect to an air flow direction defined by air flow flowing through the radiator and the heat exchanger, the radiator and the heat exchanger being fixed to the front end panel,

wherein said front end panel includes an inlet opening for introducing air into the engine compartment, the front end panel being formed to enclose a circumference of the radiator and the heat exchanger, and

wherein the radiator and the heat exchanger are integrated with each other through a duct structural member for preventing [the] air introduced from the inlet opening from bypassing the radiator and the heat exchanger,

the front end structure further comprising a fan unit arranged upstream of the radiator and the heat exchanger with respect to the air flow direction for blowing air toward the radiator and the heat exchanger.

5. (AMENDED) A front end structure according to Claim 4, wherein said front end panel is integrally formed [by]from a resin[, and fixed to a vehicle body at the vehicle front end portion thereby to constitute a vehicle structural member].

6. (AMENDED) A front end structure according to Claim 4, wherein said front end panel [is integrally formed with]defines a first air path for leading [the] air that has passed through said radiator into the engine compartment, and a second air path for leading [the] air that has passed through said radiator out of the engine compartment.

7. (AMENDED) A front end structure according to Claim 1, wherein the duct structure of the front end panel includes a shroud [fro]for closing a gap between the fan unit and the heat exchanger to prevent [the] air blown by the fan unit from bypassing the heat exchanger.

Marked up copy of Abstract:

ABSTRACT OF THE DISCLOSURE

A front end structure includes a front end panel (400) that is configured [of]as a duct structure for preventing the air introduced from a grille opening (452) from bypassing a condenser (200) and a radiator (100). A fan unit (300) is arranged on the most upstream side portion of the structure. As a result, without the need to provide parts making up a separate duct structure, fresh air low in temperature can be blown in, while at the same time, the air that has passed through the condenser (200) can be prevented from bypassing the radiator (100). Thus, the heat releasing capacity of the condenser (200) and the radiator (100) can be improved while [at the same time improving the hermetic sealing]simultaneously preventing leakage between the condenser (200) and the radiator (100) [with simple means]without adding complex structure.